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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/654,739	09/03/2003	Hung-Eil Kim	H1631	5232
7590	05/11/2004		EXAMINER	
Kenneth W. Fafrak Renner, Otto, Boisselle & Sklar, LLP Nineteenth Floor 1621 Euclid Avenue Cleveland, OH 44115-2191			LE, DUNG ANH	
			ART UNIT	PAPER NUMBER
			2818	
DATE MAILED: 05/11/2004				

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/654,739

Applicant(s)

KIM ET AL.

Examiner

DUNG A LE

Art Unit

2818

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 03 September 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 12/5/2003.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

DETAILED ACTION

Oath/Declaration

The oath/declaration filed on 9/3/2003 is acceptable.

Information Disclosure Statement

This office acknowledges of the following items from the Applicant:

Information Disclosure Statement (IDS) filed on 9/3/2003 and made of record .

The references cited on the PTOL 1449 form have been considered.

Specification

The specification has been checked to the extent necessary to determine the presence of all possible minor errors. However, the applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Rejections

Set of claims 1- 7

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-4 and 6-7 are rejected under 35 USC 102 (b) as being anticipated by Longcor (5973374).

Longcor teaches a method of forming a contact in a flash memory device (figs. 1 and 7A, 7B) that improves the depth of focus (DOF) margin and the overlay margin between a plurality of stacked gate layers and the respective contact, comprising the steps of:

forming a plurality of stacked gate layers on a semiconductor substrate, wherein each stacked gate layer extends in a predefined direction and is substantially parallel to other stacked gate layers (figs. 7A-7B);

depositing an interlayer insulating layer 24 over the plurality of stacked gate layers;

patterning a contact hole 116 between a first stacked gate layer of the plurality of stacked gate layers (having a bit line 114) and a second stacked gate layer of the plurality of stacked gate layers (having a bit line 114), wherein the contact hole is an elongated shape 116; and

depositing a conductive layer in the contact hole (fig. 7B).

Regarding claim 2, wherein the step of patterning a contact hole between a first stacked gate layer and a second stacked gate layer includes aligning a major axis of the contact hole substantially parallel to the predefined direction of the stacked gate layers (fig. 7B, col 8, lines 25-50).

Regarding claim 3, wherein the step of patterning a contact hole between a first stacked gate layer and a second stacked gate layer includes aligning a minor axis of the contact hole substantially perpendicular to the predefined direction of the stacked gate layers.

Regarding claim 4, further comprising the step of: removing a portion of the conductive layer that is outside the contact hole to leave the conductive layer 116 in the contact hole. (col 8, line 35).

Regarding claim 6, wherein the step of patterning a contact hole 116 in an elongated shape includes patterning the contact hole in the shape of an ellipse.

Regarding claim 7, wherein the step of patterning a contact hole in an elongated shape includes patterning the contact hole in the shape of a rectangle (fig. 7A).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 5 is rejected under 35 U.S.C. 103 (a) as being unpatentable over Longcor in view of the following remark.

Longcor taught the claimed inventions as applied to claim 1, except for the step of patterning a contact hole between a first stacked gate layer and a second stacked gate layer includes forming a minor axis of the contact hole to be about 71 percent to about 90 percent of a major axis of the contact hole as cited in current claim.

However, it would have been obvious to one of ordinary skill in the art at the time the invention was made to pattern a contact hole between a first stacked gate layer and a second stacked gate layer includes forming a minor axis of the contact hole to be about 71 percent to about 90 percent of a major axis of the contact hole, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or working ranges involves only routine skill in the art.

Set of claims 8-14

Claims 8- 11and 13-14 are rejected under 35 USC 102 (b) as being anticipated by Longcor (5973374).

Longcor discloses a flash memory device, comprising:

a plurality of stacked gate layers, wherein each stacked gate layer extends in a predefined direction and is substantially parallel to other stacked gate layers;
and

a contact formed between a first stacked gate layer 114 of the plurality of stacked gate layers and a second stacked gate layer 114 of the plurality of stacked gate layers, wherein the contact is formed in an elongated shape 116. (figs. 1 and 7A-7B, col 8,lines 25-50).

Regarding claim 9, wherein the contact includes a major axis, and the major axis is substantially parallel to the predefined direction of the stacked gate layers. (figs. 7A-B)

Regarding claim 10, wherein the contact 116 includes a minor axis, and the minor axis is substantially perpendicular to the predefined direction of the stacked gate layers.(fig. 7)

Regarding claim 11, wherein the contact 116 is a Vss contact (col 8, lines 30-35).

Regarding claim 13, wherein the contact hole 116 is in the shape of an ellipse.

Regarding claim 14, wherein the contact hole is in the shape of a rectangle. (fig. 7A).

Claim 12 is rejected under 35 U.S.C. 103 (a) as being unpatentable over Longcor in view of the following remark.

Longcor taught the claimed inventions as applied to claim 1, except for forming a minor axis of the contact hole to be about 71 percent to about 90 percent of a major axis of the contact hole as cited in current claim.

However, it would have been obvious to one of ordinary skill in the art at the time the invention was made to form a minor axis of the contact hole to be about 71 percent to about 90 percent of a major axis of the contact hole, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or working ranges involves only routine skill in the art.

When responding to the office action, Applicants' are advice to provide the examiner with the line numbers and page numbers in the application and/or references cited to assist the examiner to locate the appropriate paragraphs.

A shortened statutory period for response to this action is set to expire 3 (three) months and 0 (zero) day from the day of this letter. Failure to respond within the period for response will cause the application to become abandoned (see M.P.E.P 710.02(b)).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dung A. Le whose telephone number is (571) 272-1784. The examiner can normally be reached on Monday-Friday 8:00am- 4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Nelms can be reached on (571) 272-1787. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9306 for regular communications and (703) 872-9306 for After Final communications.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

DUNG A. LE
Primary Examiner
Art Unit 2818

